

**FACT SHEET STATEMENT OF BASIS
GENWAL RESOURCES, INC.
UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM (UPDES)
PERMIT NUMBER: UT0024368
MINOR INDUSTRIAL RENEWAL**

FACILITY CONTACTS

Facility Contact:	Karin Madsen	Responsible Official:	David Hibbs
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DESCRIPTION OF FACILITY

Facility Name: Genwal Resources, Inc. Crandall Canyon Mine
Mailing Address: P.O. Box 910
East Carbon, Utah 84520
Physical Location: Approximately 15 miles northwest of Huntington, Utah in Crandall Canyon
(1.5 miles west of Utah Highway 31 in Emery County)
Coordinates: Latitude: 39° 27' 38", Longitude: 111° 09' 59"
Standard Industrial
Classification (SIC): 1222 - Bituminous Coal Underground Mining (NAICS 212112)

Genwal Resources, Inc. (Genwal) is an inactive underground coal mining facility located in Crandall Canyon, a tributary to Huntington Canyon, within the Manti-La Sal National Forest. Genwal previously extracted coal from the Wasatch Plateau Coal Field (WPCF) using a combination of continuous and long-wall mining techniques. The WPCF is composed of low-sulfur bituminous coal, which produces drainage with pH greater than 6.0 standard units (SU), and a total iron concentration less than 10 milligrams per liter (mg/L) prior to any treatment. The Environmental Protection Agency (EPA) defines this type of mine drainage as "alkaline mine drainage." Production from the Crandall Canyon Mine ceased in August 2007 following a tragic collapse. However, mine water continues to flow out of the portals and therefore a UPDES discharge permit is required. Genwal has had trouble meeting iron effluent limitations in the past, and as a result, built an iron treatment system. Over the last four years Genwal has violated its iron limitation one time and has had to complete a Toxicity Identification Evaluation (TIE) on two occasions. The identification of the toxicant was not completed, but it was thought that the failure of WET testing happened as a result of trying to vary the amount and use of chemicals in the iron treatment system.

DESCRIPTION OF DISCHARGE

<u>Outfall</u>	<u>Description</u>
001	Surface water drainage from the mine facilities. Outfall 001 is an 18-inch pipe on the east side of the sediment pond discharging directly to Crandall Creek.
002	Outfall 002 is a spillway of the mine water iron treatment system into a 12-inch discharge pipe to the Crandall Creek culvert. Outfall 002 continuously discharges mine water from former underground mining areas.

RECEIVING WATERS AND STREAM CLASSIFICATION

As a tributary to Huntington Creek, Crandall Creek is classified as 1C, 2B, 3A, and 4 according to *Utah Administrative Code (UAC) R317-2-13*.

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| Class 1C | -Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water. |
| Class 2B | -Protected for secondary contact recreation such as boating, wading, or similar uses. |
| Class 3A | -Protected for cold-water species of game fish and other cold-water aquatic life, including the necessary aquatic organisms in their food chain. |
| Class 4 | -Protected for agricultural uses including irrigation of crops and stock watering. |

BASIS FOR EFFLUENT LIMITATIONS

In accordance with regulations promulgated in *40 Code of Federal Regulations (CFR) Part 122.44* and in *UAC R317-8-4.2*, effluent limitations are derived from technology-based effluent limitation guidelines, Utah Secondary Treatment Standards (*UAC R317-1-3.2*) or Utah Water Quality Standards (*UAC R317-2*). In cases where multiple limits have been developed, those that are more stringent apply. In cases where no underlying standards have been developed, Best Professional Judgment (BPJ) may be used where applicable to set effluent limits.

- 1) Genwal's discharge meets the EPA definition of "alkaline mine drainage." As such, it is subject to the technology based effluent limitations in *40 CFR Part 434.45*. Technology based limits used in the permit are listed below.
 - a. Total suspended solids (TSS) daily maximum limit.

- b. For discharges composed of surface water or mine water commingled with surface water (Outfall 001), *40 CFR Part 434.63* allows alternate effluent limits to be applied when discharges result from specific runoff events detailed below and in the permit. Genwal has the burden of proof that the described runoff event occurred.
- i. For runoff events (rainfall or snowmelt) less than or equal to a 10-year 24-hour precipitation event, settleable solids shall be substituted for TSS and shall be limited to 0.5 milliliters per liter (ml/L). All other effluent limitations must be achieved concurrently, as described in the permit.
- ii. Any discharge or increase in the volume of a discharge caused by precipitation within any 24 hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) may comply with the following limitations instead of the otherwise applicable limitations for Outfall 001:

Effluent Characteristics	30 Day Average	Daily Minimum	Daily Maximum
pH, SU	NA	6.5	9.0

In order to substitute the above limitation, the sample collected during the storm event must be analyzed for all permitted parameters specified under *Part I.D.* Such analyses shall be conducted on either grab or composite samples.

- 2) TSS 30-day and 7-day averages are based on Utah Secondary Treatment Standards.
- 3) Daily minimum and daily maximum limitations on pH are derived from Utah Secondary Treatment Standards and Water Quality Standards.
- 4) Total dissolved solids (TDS) are limited according to Water Quality Standards and policies established by the Colorado River Basin Salinity Control Forum. TDS is limited by both mass loading and concentration requirements as described below:
- a. Since discharges from Genwal eventually reach the Colorado River, TDS mass loading is limited according to policies established by the Colorado River Basin Salinity Control Forum (Forum), as authorized in *UAC R317-2-4* to further control salinity in the Utah portion of the Colorado River Basin. On February 28, 1977 the Forum produced the "*Policy For Implementation of Colorado River Salinity Standards Through the NPDES Permit Program*" (Policy), with the most current subsequent triennial revision dated October 2014. Based on Forum Policy, provisions have previously been made for salinity-offset projects to account for any

TDS loading in excess of the permit requirement. Salinity-offset provisions have once again been included in Genwal's permit as the facility remains current on the requirements included therein to account for all excess TDS loading. These provisions and requirements, as described further in the permit, will remain in Genwal's renewal permit as appropriate.

- b. Genwal's permit provisions currently include a TDS concentration limitation from the State Water Quality Standard for TDS, which is 1,200 mg/L. A review of the past 4 years of discharge data indicates that Genwal should be able to continue to comply with this limitation.
- 5) Limitations on total iron, total aluminum and dissolved oxygen (DO) are water quality based and derived in the WLA. The iron limitation is based upon the State Water Quality Standard of 1.0 mg/L for dissolved iron (*UAC R317-2 Table 2.14.2*) and the WLA limitation of 1.14 for total recoverable iron. Total recoverable iron is a more stringent limitation than dissolved iron. Therefore, a permit limit of 1.14 mg/L for total iron will be included in the renewal permit and shall apply to each of the discharge points.
- 6) The total aluminum effluent limit from the WLA is 0.856 mg/L, which will be included in the permit as a daily maximum. An iron treatment system was installed in March of 2010. In the treatment system alum is used as a coagulant. The previous permit required that aluminum be monitored on a monthly basis. If the aluminum exceeded 0.927 mg/L, the permit was to be reopened and modified to add aluminum. The aluminum value was exceeded seven times from 3/31/2014 through 7/31/2015. However the permit was not reopened and modified during the last permit cycle.
- 7) Oil and Grease are limited to 10 mg/L by BPJ, as this is consistent with other industrial facilities statewide.
- 8) The design flow as submitted in the application is 1.5 million gallons per day (MGD). This has not changed from the last permit. However, the background flow in Crandall Creek has changed from 1.1 cfs to 0.3 cfs.

WASTE LOAD ANALYSIS, ANTIDegradation REVIEW AND REASONABLE POTENTIAL ANALYSIS

Effluent limitations may be derived using a Waste Load Analysis (WLA), which is appended to this statement of basis as Addendum I. The WLA incorporates Secondary Treatment Standards, Water Quality Standards, Anti-degradation Reviews (ADR), as appropriate, and designated uses into a water quality model that projects the effects of discharge concentrations on receiving water quality. Effluent limitations are those that the model demonstrates are sufficient to meet State water quality standards in the receiving waters.

Based on the fact that the receiving waters are classified as 1C a level II Anti-degradation was required for this permit renewal. The Level II review was completed and received by the Division of Water Quality on October 30, 2015. The Level II submission received DWQ certification and approval on March 1, 2016 and is attached to this FSSOB as Addendum II.

Since January 1, 2016, DWQ has conducted reasonable potential analysis (RP) on all new and renewal applications received after that date. RP for this permit renewal was conducted following DWQ's September 10, 2015 Reasonable Potential Analysis Guidance (RP Guidance). There are four outcomes defined in the RP Guidance: Outcome A, B, C, or D. These Outcomes provide a frame work for what routine monitoring or effluent limitations are required.

A quantitative RP analysis could not be properly completed because there is only one value for the metals (except for iron and aluminum which will be included in the permit with limits). One value does not allow for a coefficient of variation (CV) to be calculated and causes doubt of the final quantitative RP analysis. Therefore, this renewal permit will require that the permittee obtain more metals data by monitoring on a quarterly basis at both Outfalls for total concentrations of arsenic, boron, cadmium, chromium, copper, lead, mercury, nickel, silver, total cyanide and zinc. Quarterly selenium monitoring is only included at Outfall 001. RP data and analysis are included in Addendum III. Based on this data it can be seen that the only sample obtained for selenium had a concentration of 30 ug/L while the downstream standard not to exceed, as determined from the WLA, was 5 ug/L. As a result, selenium will be monitored on a monthly basis at Outfall 002 for the first year of the permit. Based on the data generated in the first year of the permit, a decision will be made to include selenium limits in the permit or to reduce the monitoring requirements for selenium at Outfall 002 to quarterly along with all the other metals. If a selenium limit is added to the permit, proper permit modification procedures must be followed and the effluent limit(s) will be based on the WLA developed for Outfall 002.

EFFLUENT LIMITATIONS, SELF-MONITORING, AND REPORTING REQUIREMENTS

The effluent limitations and monitoring requirements for Outfalls 001 & 002 shall be completed as outlined below. Effluent self-monitoring requirements are developed in the *Utah Monitoring, Recording and Reporting Frequency Guidelines* as effective December 1, 1991. Reports shall be made via NetDMR or on Discharge Monitoring Report (DMR) forms and are due 28 days after the end of the monitoring period (month, quarter, year, etc.). Lab sheets for biomonitoring must be attached to the biomonitoring DMR.

Effluent Characteristics	Effluent Limitations				Monitoring Requirements	
	30 Day Average	7 Day Average	Daily Minimum	Daily Maximum	Sample Frequency	Sample Type
Flow, ¹ MGD	1.5	² NA	NA	Report	Monthly	Continuous Recorder
TSS, mg/L	25	35	NA	70	Monthly	Grab
Total Iron, mg/L	NA	NA	NA	1.14	Monthly	Grab
Total Selenium, mg/L a/	NA	NA	NA	NA	Monthly/ Quarterly	Grab
Oil & Grease, mg/L b/	NA	NA	NA	10	Monthly	Grab
Total Aluminum, mg/L a/	NA	NA	NA	0.856	Monthly	Grab
TDS, mg/L c/	Report	NA	NA	1200	Monthly	Grab
pH, standard units	NA	NA	6.5	9.0	Monthly	Grab
Dissolved Oxygen, mg/L	NA	NA	5.5	NA	Monthly	Grab
Sanitary Waste d/	NA	NA	NA	None	Monthly	Visual
Chronic Whole Effluent Toxicity ³	NA	NA	NA	Pass, IC ₂₅ > 87% effluent	Quarterly	Composite
Total Arsenic, mg/L c/	NA	NA	NA	NA	Quarterly	Grab
Total Boron, mg/L e/	NA	NA	NA	NA	Quarterly	Grab
Total Cadmium, mg/L e/	NA	NA	NA	NA	Quarterly	Grab
Total Chromium, mg/L e/	NA	NA	NA	NA	Quarterly	Grab
Total Copper, mg/L e/	NA	NA	NA	NA	Quarterly	Grab
Total Lead, mg/L e/	NA	NA	NA	NA	Quarterly	Grab
Total Mercury, mg/L e/	NA	NA	NA	NA	Quarterly	Grab
Total Nickel, mg/L e/	NA	NA	NA	NA	Quarterly	Grab
Total Silver, mg/L e/	NA	NA	NA	NA	Quarterly	Grab
Total Cyanide, mg/L e/	NA	NA	NA	NA	Quarterly	Grab
Total Zinc, mg/L e/	NA	NA	NA	NA	Quarterly	Grab

¹ MGD: million gallons per day

² NA: not applicable

³ See Biomonitoring Requirements

- a/ Aluminum is limited and monitored only at Outfall 002. Selenium is not limited at Outfall 001, but shall be monitored quarterly with the other metals listed for Outfall 001. Selenium shall be monitored monthly for the first year of the permit at Outfall 002. Based on the data from the year of monitoring the Director will determine if a selenium limit shall be included in the permit. If a selenium limit shall be included in the permit it shall be done so following proper administrative procedures in R 317-8 for permit modification. If the Director determines that no effluent limit for selenium is needed, selenium shall be monitored at Outfall 002 on a quarterly basis for the rest of the permit cycle.
- b/ In addition to monthly sampling for oil and grease, a visual inspection for oil and grease, floating solids, and visible foam shall be performed at least twice per month at 001 and 002. There shall be no sheen, floating solids, or visible foam in other than trace amounts. If sheen is observed, a sample of the effluent shall be collected immediately thereafter and oil and grease shall not exceed 10 mg/L in concentration.
- c/ The TDS concentration from each of the outfalls shall not exceed 1200 mg/L as a daily

maximum limit. No tons per day loading limit will be applied if the concentration of TDS in the discharge is equal to or less than 500 mg/L as a thirty-day average. However, if the 30-day average concentration exceeds 500 mg/L, then the permittee cannot discharge more than 1 ton per day as a sum from all discharge points. Upon previous determinations by the Director that the permittee is not able to meet the 500 mg/L 30-day average or the 1 ton per day loading limit, the permittee is required to continue to participate in and/or fund a salinity offset project to include the TDS offset credits as appropriate (*See permit provisions for further details*).

- d/ There shall be no discharge of sanitary waste and visual observations performed at least monthly shall be conducted.
- e/ These metals shall be monitored as required at both outfalls if discharge occurs. The permittee is required to get the lowest detection limit possible using standard methods and certified laboratories.

SIGNIFICANT CHANGES FROM PREVIOUS PERMIT

The significant changes from the existing permit are as follows: a total aluminum effluent limit has been added at Outfall 002. Total iron was reduced from 1.24 mg/L to 1.14 mg/L and changed to a daily maximum from 30 day average. The passing of the chronic toxicity test has gone from an $IC_{25} > 67\%$ to an $IC_{25} > 87\%$, the WET test will be done quarterly instead of semi-annually. Quarterly monitoring at both Outfalls for the following total metals has been added; arsenic, boron, cadmium, chromium, copper, lead, mercury, nickel, silver, cyanide and zinc. Quarterly monitoring of Selenium is included at Outfall 001 and monthly at Outfall 002 for the first year of the permit. The Director may include an effluent limit for selenium at Outfall 002 based on the monitoring data or require that the monitoring frequency for selenium change from monthly to quarterly for the rest of the permit period at Outfall 002.

STORM WATER REQUIREMENTS

The storm water requirements are based on the UPDES Multi-Sector General Permit (MSGP) for Storm Water Discharges for Industrial Activity, General Permit No. UTR000000. All sections of the MSGP that pertain to discharges from wastewater treatment plants have been included and sections which are redundant or do not pertain have been deleted.

The permit requires the preparation and implementation of a storm water pollution prevention plan for all areas within the confines of the plant. Required elements of this plan are:

- 1) Development of a pollution prevention team,
- 2) Development of drainage maps and material stockpiles,
- 3) An inventory of exposed material,
- 4) Spill reporting and response procedures,

- 5) A preventative maintenance program,
- 6) Employee training,
- 7) Certification that storm water discharges are not mixed with non-storm water discharges,
- 8) Compliance site evaluations and potential pollutant source identification, and
- 9) Visual examinations of storm water discharges.

This plan is required to be maintained on-site to reflect current site conditions and made available for review upon request and/or inspections.

PRETREATMENT REQUIREMENTS

This facility does not discharge process wastewater to a sanitary sewer system. Any process wastewater that the facility may discharge to the sanitary sewer, either as a direct discharge or as a hauled waste, is subject to federal, state, and local pretreatment regulations. Pursuant to section 307 of the Clean Water Act, the permittee shall comply with all applicable federal general pretreatment regulations promulgated, found in 40 CFR 403, the state's pretreatment requirements found in UAC R317-8-8, and any specific local discharge limitations developed by the Publicly Owned Treatment Works (POTW) accepting the waste.

In accordance with 40 CFR 403.12(p)(1), the permittee must notify the POTW, the EPA Regional Waste Management Director, and the State hazardous waste authorities, in writing, if they discharge any substance into a POTW which if otherwise disposed of would be considered a hazardous waste under 40 CFR 261. This notification must include the name of the hazardous waste, the EPA hazardous waste number, and the type of discharge (continuous or batch).

BIOMONITORING REQUIREMENTS

As part of a nationwide effort to control toxic discharges, biomonitoring requirements are being included in permits for facilities where effluent toxicity is an existing or potential concern. In Utah, this is done in accordance with the *State of Utah Permitting and Enforcement Guidance Document for Whole Effluent Toxicity Control (Biomonitoring (2/1991))*. Authority to require effluent biomonitoring is provided in UAC R317-8, *Utah Pollutant Discharge Elimination System* and UAC R317-2, *Water Quality Standards*.

A review of the past four years of WET testing reports indicates that Genwal has failed chronic WET tests. Genwal has completed two toxicity identification evaluations and it is probable that the failures may have been associated with the changing of coagulants and flocculants or variance in their concentrations. Improper operation of the treatment system is a concern, but it is not known if this is the source of the problem. Observing the metals data obtained, it appears that selenium is in much higher concentration than expected (30 ug/L in the effluent and the WLA number for effluent limits is 5 ug/L). Based on these facts, quarterly WET testing is more appropriate than semi-annual testing. Therefore, chronic testing will increase to quarterly using

both species. It is important to remember that the biomonitoring language in the permit indicates that after 10 consecutive tests, if no chronic toxicity is indicated the permittee may request a reduction in testing frequency and/or reduction to one species.

Genwal will conduct chronic whole effluent toxicity (WET) testing quarterly using both test species *Ceriodaphnia dubia* and *Pimephales promelas* (fathead minnow) from a composite sample at Outfall 002 and Outfall 001. Chronic toxicity occurs when the inhibitory concentration to 25% of the population (IC_{25}) is less than or equal to an effluent concentration of 87% as derived from the WLA. The IC_{25} is the concentration of toxicant (given in % effluent) that would cause a 25% reduction in mean young per female or a 25% reduction in overall growth for the test population. The permit also contains the standard requirements for re-testing upon failure of a WET test, and for a Toxicity Reduction Evaluation (TRE) as appropriate.

A previous laboratory investigation indicated that pH drift during the test caused an artifactual increase in metal concentrations, which resulted in toxicity. According to the method set forth by EPA (*Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Fourth Edition, October 2002, EPA-821-R-02-013*), it is acceptable to use a carbon dioxide atmosphere to prevent pH drift once it has been demonstrated that pH drift is artificially impacting the toxicity of the sample. As such, the renewal permit will once again allow the use of a carbon dioxide atmosphere in routine testing in conjunction with an unmodified test. The chronic WET testing provisions are detailed further in the permit as well as the toxicity limitation re-opener provision.

PERMIT DURATION

As stated in *UAC R317-8-5.1(1)*, UPDES permits shall be effective for a fixed term not to exceed five (5) years.

Drafted by Mike Herkimer
Environmental Scientist
Utah Division of Water Quality
May 17, 2016
Wasteload Allocation by Dave Wham
Storm Water Review by Mike George
Salinity Review by Matt Garn
Pretreatment Review by Jennifer Robinson
TMDL Review by Amy Dickey

ADDENDUMS

- I. Waste Load Analysis
- II. Anti-Degradation II Review and Approval
- III. RP Analysis and Associated Data
- IV. Four Years of DMR Data

The draft permit, fact sheet and statement of basis, wasteload allocation and associated material were public noticed in the Emery County Progress, and under "Public Participation" on the Division of Water Quality Web Site, www.waterquality.utah.gov, from to .

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